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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/941,411	08/28/2001	David Polinsky	M-11636 US	6137

36257 7590 09/04/2003

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EXAMINER

ASSAF, FAYEZ G

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 09/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/941,411

Applicant(s)

POLINSKY ET AL.

Examiner

Fayez G. Assaf

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,6-9,12-17,20,26-33,36 and 47-49 is/are pending in the application.
- 4a) Of the above claim(s) 3,9 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6-8,12-17,26,28-33,36 and 47-49 is/are rejected.
- 7) ☒ Claim(s) 27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election **without** traverse of Species 1: claims 1-3, 6-9, 12-17, 20, 26-33, 36 and 47-49 in Paper No. 6 is acknowledged.

The Examiner notes that the language of claims 3 and 9 recites the surface passing the remainder of the wavelength components. This feature clearly pertains to other species.

Claim 20 depends from a cancelled claim.

The status of the claims is as follows:

Claims 1-2, 6-8, 12-17, 26-33, 36 and 47-49 are believed to read on the elected Species.

Claims 4, 5, 10, 11, 18, 19, 21-25, 34, 35, 37-46 have been cancelled by Applicants.

Claims 3, 9, 20 have been withdrawn from further consideration for the reasons set forth above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 8, 14, 15, 26, 28, 29, 36 and 48 are rejected under 35 U.S.C. 102(b) as being anticipated by Aksyuk et al. (US 5,943,454).

Regarding 1 and 48, Aksyuk discloses a hybrid optical device (see Fig. 4A, 4B and 10) comprising: a first set of one or more input optical channels that convey one or more beams of radiation (92b, 94b of Fig. 4; 91a, 91c of Fig. 10); a second set of one or more output optical channels (90d, 90b of Fig. 4; 91d, 91b of Fig. 10) which receive radiation from said one or more beams; a filter (111 of Fig. 4A) passing at least one first portion of the one or more beams from selected channel(s) of the first set and reflecting at least one second portion of the one or more beams (see Fig. 4A and 4B, line 28 to line 33 of Col. 5); a reflective surface (106 of Fig. 4 and 10) reflecting at least some of the radiation in said at least one first portion (λ_5 to λ_7 in Fig. 4A); and an actuator (4a of Fig. 6A) that moves said surface to each of a plurality of positions so that the one or more beams travel from selected channel(s) of said first set to selected channel(s) of said second set (line 4 to line 11 of Col. 6), wherein said surface at each of the plurality of positions causes a selected corresponding portion

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of the radiation passed by the filter to be directed to the selected channel(s) in the second set (see Fig. 4, line 29 to line 44 of Col. 6).

Regarding claim 2, Aksyuk discloses the filter reflecting a selected portion of each of wavelength components (λ_5 to λ_7 in Fig. 4A) in the radiation in at least one of the beams and passing the remainder of such wavelength components (λ_8 to λ_{10} in Fig. 4A).

Regarding claim 8, Aksyuk discloses the filter being a passband filter that reflects wavelength components of the radiation in at least one of the beam(s) from the first set having wavelengths outside its passband (λ_5 to λ_7 in Fig. 4A) and passes wavelength components of the radiation in the beams having wavelengths within its passband (λ_8 to λ_{10} in Fig. 4A).

Regarding claim 14, Aksyuk discloses a total number of optical channels of said first set and said second set together being more than two (see Fig. 3 and 10).

Regarding claim 15, Aksyuk discloses a first of the plurality of positions (exchange position as exemplified in Fig. 3A) corresponding to a first combination of optical paths through which said beam(s) travels from said first set (90a and 90c in Fig. 3A) to said second set (90d and 90b in Fig. 3A), and

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a second of the plurality of positions (by pass state as exemplified in Fig. 3A) corresponding to a second combination of optical paths through which said beam(s) travels from said first set to said second set, wherein said first combination is different from said second combination (see Fig.'s 3A and 3B), so that the device acts as a switch when the actuator moves the surface between the first and second of the plurality of positions.

Regarding claim 26, Aksyuk discloses an optical element (110 of Fig. 3A) in an optical path between the first and second sets, said element focusing the one or more beams from the first set and to the second set.

Regarding claim 28, Aksyuk discloses a gradient index lens (110 of 3A, line 62 to line 67 of Col. 4) between the input and output channels on one hand and the filter and the surface on the other.

Regarding claim 29, Aksyuk inherently discloses the actuator moving the surface by electrostatic force.

Regarding claim 36, Aksyuk discloses the first set comprising two input channels (90a and 90c of Fig. 3A) and the second set comprising two output channels (90b and 90d of Fig. 3A).

Claims 1, 2, 6, 7, 15-17, 33 and 47-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al. (US 4,498,730).

Regarding 1 and 48, Tanaka discloses a hybrid optical device (see Fig. 5) comprising: a first set of one or more input optical channels that convey one or more beams of radiation (23 of Fig. 5); a second set of one or more output optical channels (24-29 of Fig. 5) which receive radiation from said one or more beams; a filter (31 of Fig. 5) passing at least one first portion of the one or more beams from selected channel(s) of the first set and reflecting at least one second portion of the one or more beams (line 60 to line 64 of Col. 3); a reflective surface (21 of Fig. 5) reflecting at least some of the radiation in said at least one first portion (i.e. λ_2); and an actuator that moves said surface to each of a plurality of positions so that the one or more beams travel from selected channel(s) of said first set to selected channel(s) of said second set (see claim 1), wherein said surface at each of the plurality of positions causes a selected corresponding portion of the radiation passed by the filter to be directed to the selected channel(s) in the second set.

Regarding claim 2, Tanaka discloses the filter reflecting a selected portion of each of wavelength components (λ_1 is

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100% reflected and λ_2 is 0% reflected) in the radiation in at least one of the beams and passing the remainder of such wavelength components.

Regarding claim 6, Tanaka discloses the surface at each of the plurality of positions causing substantially all of the radiation in the remainder of such wavelength components to be reflected to channel(s) in the second set (i.e. λ_2 being reflected by the mirror to the second set in Fig. 5, line 13 to line 16 of Col. 4).

Regarding claim 7, Tanaka discloses the surface at the plurality of positions causing different intensities of the radiation in the remainder of such wavelength components to be reflected to channel(s) in the second set (line 54 to line 59 of Col. 5).

Regarding claims 47 and 49, Tanaka discloses the actuator moving the filter to each of a plurality of positions so that the one or more beams travel from selected channel(s) of the first set to selected channel(s) of second set, wherein the filter at each of the plurality of positions causes a selected corresponding portion of the radiation to be directed to the selected channel(s) in the second set (line 66 of Col. 3 to line 16 of Col. 4).

Regarding claim 15, Tanaka discloses a first of the plurality of positions corresponding to a first combination of optical paths through which said beam(s) travels from said first set (from fiber 23 in Fig. 5) to said second set (first selection of output fiber in Fig. 5, for example fiber 25), and a second of the plurality of positions (second selection of output fiber in Fig. 5, for example fiber 26) corresponding to a second combination of optical paths through which said beam(s) travels from said first set to said second set, wherein said first combination is different from said second combination, so that the device acts as a switch when the actuator moves the surface between the first and second of the plurality of positions.

Regarding claim 16, Tanaka discloses the surface at the first and second positions causing substantially all of the radiation in the remainder of such wavelength components to be reflected to channel(s) in the second set (i.e. λ_2 being reflected by the mirror to the second set in Fig. 5, line 13 to line 16 of Col. 4).

Regarding claim 17, Tanaka discloses the surface at the first and second positions causing different intensities of the radiation in the remainder of such wavelength components to be

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reflected to channel(s) in the second set (line 54 to line 59 of Col. 5).

Regarding claim 33, Tanaka inherently discloses the filter and the surface being such that the input and output channels are bi-directional.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8, 12, 13, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka.

Regarding claim 8, Tanaka discloses the claimed invention including a filter for reflecting a wavelength but passing light of another wavelength (line 60 to line 64 of Col. 3). Tanaka does not expressly disclose the filter being a bandpass filter.

However, bandpass filters are well known and routinely employed in optical switching devices.

It would have been obvious, at the time the invention was made, to a person having ordinary skill in the art to utilize a bandpass filter in the invention of Tanaka for the purpose of switching a multiplicity of wavelength signals passed by the filter.

Regarding claim 12, the combination discloses the surface at each of the plurality of positions causing substantially all of the remainder of such wavelength components to be reflected to channels(s) in the second set.

Regarding claim 13, the combination discloses the surface at the plurality of positions causing different intensities of the radiation in the remainder of such wavelength components to be reflected to channels(s) in the second set.

Regarding claim 30, Tanaka discloses the claimed invention including a substrate having the surface and the actuator connected to (see Fig. 5, line 48 to line 49 of Col. 4). Tanaka does not disclose the substrate being a silicon substrate.

However, silicon substrates are well known to be used as supporting means in rotating reflecting surfaces. The choice of such material does not serve as basis for patentability.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize said silicon substrate, since it has been held to be within the

ordinary skill of worker in the art to select a known material on the basis of its suitability for the intended use. In re Leshin, 125 USPQ 416.

One would have been motivated to use silicon material for the substrate because of its durability, availability and suitability for mass production.

Regarding claim 31, Tanaka discloses the actuator rotating the surface (see Fig. 5).

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aksyuk et al.

Aksyuk discloses the claimed invention except for the actuator comprising a plurality of interdigitated fingers.

However, such a micromechanical actuator is well known in the art, particularly, in applications requiring interruption of the optical signal (on/off state).

It would have been obvious, at the time the invention was made, to a person having ordinary skill in the art to utilize said actuator in the invention of Aksyuk because of its reliability.

Allowable Subject Matter

Claim 27 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 27 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest a ferrule which supporting the first set and the second set, a package encasing the surface and the actuator, and *a transparent window on the package* as set forth in the claimed combination.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fayez G. Assaf whose telephone number is (703) 306-5526. The examiner can normally be reached on 8-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Drew Dunn can be reached on (703) 305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

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Fayez G. Assaf
Examiner
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FA
8/24/03

A handwritten signature in black ink, appearing to read "Fayez Assaf", with a stylized flourish at the end.